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**REMARKS**

Claims 1-8 and 10-13 are pending in the present Application. No claims have been canceled, claim 1 has been amended, and no claims have been added, leaving Claims 1-8 and 10-13 for consideration upon entry of the present Amendment.

Claim 1 has been amended to recite "a flow direction" in order to provide proper antecedent basis for "the flow direction."

No new matter has been introduced by these amendments. Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

**Claim Rejections Under 35 U.S.C. § 112, Second Paragraph**

Claims 1 and 8 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Examiner has stated that there is insufficient antecedent basis for the limitation "the flow" in claim 1 at line 3. Applicant has amended claim 1 to recite "a flow" to provide proper antecedent basis for the limitation "the flow."

The Examiner has also stated that the term "partially dissolve" in claim 8 is a relative term that renders the claim indefinite. Applicants respectfully submit that the proper standard for determining indefiniteness is whether one of ordinary skill in the art would understand what is claimed when the claim is read in light of the specification. *Seattle Box Co. v. Industrial Crating and Packing, Inc.*, 731 F.2d 818, 826, 221 U.S.P.Q. 568, 573-74 (Fed. Cir. 1984). In addition, MPEP § 2173.05(b) teaches that broadening modifiers are acceptable as long as the scope of the claim is clear. One method to determine the clarity of the claim is to assess whether or not one of ordinary skill in the art could readily determine infringement. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983). In the instant case, the term "partially dissolve" describes solvation of a polymeric resin by a plasticizer. Applicant submits that plasticizers that partially dissolve a polymeric resins are known to those of ordinary skill in the art. Further, the specification lists specific examples of such plasticizers. (¶ [0045]) Applicant also submits that the plasticizing of a polymeric resin can be clearly assessed by measuring the melt viscosity with a rheometer. In addition, the resistivity of the composition can

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be measured with a voltmeter. With these two easily determined parameters, one of ordinary skill in the art can readily determine infringement. Accordingly, Applicant respectfully submits that the term "partially dissolve" does not render claim 8 indefinite.

Reconsideration and withdrawal of this rejection are respectfully requested.

Claim Rejections Over U.S. Patent No. 6,388,046 to Campbell et al.

Claims 1-8, 10 and 13 stand rejected under 35 U.S.C. § 102(b), as allegedly anticipated by, or in the alternative, under 35 U.S.C. § 103(a), as allegedly obvious over U.S. Patent No. 6,388,046 to Campbell et al. ("Campbell"). (Office Action dated May 18, 2006, page 3) Claims 11 and 12 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Campbell. (Office Action dated May 18, 2006, page 4) Applicant respectfully traverses these rejections.

The present application is directed to Applicant's discovery that modification of the viscosity of the composition can increase the anisotropy of the electrical resistivity of the composition. Applicant respectfully submits that Campbell fails to disclose multiple elements that are required by the present claims, including a conductive material, a plasticizer, an effective viscosity, or heating above the Tg or melting temperature.

The Examiner has stated that Campbell discloses a flame retardant resin comprising a blend of different polymers comprising, *inter alia*, a first bisphenol-A homopolycarbonate, a second bisphenol-A homopolycarbonate with a molecular weight of about 71% of the first polycarbonate, and XPP. (Office Action dated May 18, 2006, page 3) The Examiner construed the low molecular weight carbonate with the low melt viscosity and the XPP phosphoramido with a low Tg of at least 0° C to meet the limitation of plasticizer in the claims based on the Applicant's disclosure at ¶ [0045] and Example 1. The Examiner has stated that the prior art process, the components used in the process and the utility of the product are identical to that by the applicants and the claimed resistivity ratio of resistivities will be anticipated. The Examiner has further stated that, in the alternative, it would have been obvious to optimize the process conditions including viscosity with a reasonable expectation of success because the prior art teaches such modifications including reduced viscosity to benefit from the enhanced processability.

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Campbell is directed to a flame retardant material and fails to disclose a conductive material. Campbell therefore necessarily fails to disclose a ratio of resistivity as required by Claim 1. Campbell further fails to disclose heating the polymeric resin to a temperature greater than its glass transition temperature or to a temperature greater than its melting temperature. Applicant respectfully submits that Campbell cannot anticipate the present claims because Campbell fails to disclose all the elements of the claims.

Although Applicant believes these reasons are sufficient to traverse the anticipation rejection, Applicant also disputes the Examiner's construction of plasticizer. The plasticizer is defined in the specification as

a low molecular weight organic or inorganic species, which can facilitate a reduction in melt viscosity during the blending of the polymeric resin with the carbon nanotubes.

(¶ [0045]). The specification further discloses several low molecular weight organic or inorganic species that are suitable examples of plasticizers such as alcohols, acetone, toluene, methyl ethyl ketone, liquid carbon dioxide, liquid nitrogen, water, monomers such as styrene, acrylates, dibutylphthalate, resorcinol diphosphate, vinylidene fluoride, hexafluoropropylene, or the like. (¶ [0045]) Example 1 discloses the use of resorcinol diphosphate as a plasticizer. The specification does not disclose phosphoramides as plasticizers.

Campbell fails to teach or suggest a plasticizer as required by the present claims for at least two reasons. First, Applicant respectfully submits that the second polycarbonate of Campbell does not meet the definition of a low molecular weight plasticizer as disclosed in the specification. Campbell discloses that the second polycarbonate has an average molecular weight between about 16,000 and about 26,000. (Col. 6, ll. 4-9). Applicant submits that this molecular weight range is high and cannot read upon the low molecular weight plasticizers disclosed in the specification. Applicant therefore disputes Examiner's construction of polycarbonate as a low molecular weight plasticizer.

Second, Campbell discloses a phosphoramido with a low Tg of at least 0° C as a source of phosphorous to improve the heat deflection temperature of thermoplastic resins. (Abstract; Col. 7, ll. 10-18) Campbell further discloses that a phosphoramido with a low

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Tg of at least 0° C is not an effective plasticizer since it does not significantly lower the glass transition temperature of the base polymer.

[I]t is believed that selection of each of R<sup>1</sup>, R<sup>2</sup>, and R<sup>3</sup> residues that result in restricted rotation of the bonds connected to the phosphorus provide an increased glass transition point in comparison to similar phosphoramides with residues having a lesser degree of restriction.

(Col. 7, ll. 20-24) Campbell further discloses that Examples 1 and 6 demonstrate that addition of XPP advantageously did not significantly lower the Tg of polycarbonate compared to resorcinol bis(diphenyl phosphate) (RDP). (Table 1; Col. 19, ll. 28-30; Table IV; Col. 21, ll. 12-14)

Applicant respectfully submits that Campbell fails to disclose, *inter alia*, a conductive material, a plasticizer, an effective viscosity, or heating above the Tg or melting temperature. Applicant further disputes that Campbell discloses an identical process, components, or utility. Campbell discloses flame retardant and heat resistant materials that comprise a phosphoramido with a low Tg of at least 0° C, which does not significantly lower the Tg of the polymeric resin, while the present invention is directed to a conductive material that comprises a plasticizer, which significantly lowers the Tg of the polymeric resin, and carbon nanotubes. To anticipate a claim, a reference must disclose each and every element of the claim. *Lewmar Marine v. Varient Inc.*, 827 F.2d 744, 747, 3 U.S.P.Q.2d 1766, 1768 (Fed. Cir. 1987). Given the multiple different elements between Campbell and the present application, Applicant respectfully submits that Campbell cannot anticipate the present claims.

In addition, Applicant respectfully submits that Campbell cannot render obvious the present claims because Campbell fails to disclose all elements of the claims and fails to provide a motivation to modify the composition of Campbell with a reasonable expectation of success. For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed.

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Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

With respect to the rejection of Claims 1-8, 10, and 13, the Examiner has stated that it would have been obvious to reduce the viscosity to obtain the benefit of enhanced processability. (Office Action dated May 18, 2006, page 4) With respect to the rejection of Claims 11-12, the Examiner has stated that the prior art is silent about the variation in viscosity to attain the desired resistivity ratios; however, it would be obvious to one of ordinary skill in the art optimize the process conditions to attain the desired properties with a reasonable expectation of success because the prior art teaches the utility of the product in electronic goods. (Office Action dated May 18, 2006, page 5) Applicant respectfully traverses these rejections.

As described above, Campbell is directed to flame retardant and heat resistant compositions and fails to disclose a conductive composition. Accordingly, the material of Campbell is useful in "electronic goods" as a flame retardant and heat resistant material and not as a conductive material as required by the present claims. Because Campbell fails to disclose a conductive material, Applicant submits that one of ordinary skill in the art would not be motivated to modify Campbell to provide a material with the claimed resistivity ratios. Further, Campbell expressly teaches away from the use of a plasticizer like RDP because these samples "had unacceptably low Tg's." (Col. 19, ll. 28-30) Applicant respectfully submits that Campbell fails to disclose the claimed viscosity and resistivity ratio as well as use of a plasticizer and therefore fails to teach or suggest all elements of the claims. In addition, one of ordinary skill in the art would not be motivated to modify Campbell since Campbell is directed to a flame retardant material rather than to a conductive material and Campbell expressly teaches away from use of a plasticizer as well as compositions that "had unacceptably low Tg's." Applicant respectfully submits that the Examiner has therefore failed to establish a *prima facie* case of obviousness. Reconsideration and withdrawal of this rejection are respectfully requested.

The Examiner has further stated that U.S. Pat. No. 5,651,922 to Nahass et al. ("Nahass") discloses that multi-walled carbon fibrils are the most common nanotubes. (Office Action dated May 18, 2006, page 4) To the extent that the Examiner has relied on Nahass in making the rejection, Applicant respectfully submits that Nahass fails to remedy the deficiencies of Campbell because Nahass fails to teach or suggest the claimed

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plasticizer or resistivity ratio. In addition, Applicant notes that Nahass discloses applying shear to break down carbon fibril aggregates. (Abstract) In direct contrast, the present application is directed to the use of a plasticizer to reduce shear forces to minimize break down of carbon nanotubes. (¶ [0050]) Applicant respectfully submits that Nahass cannot remedy the deficiencies of Campbell because Nahass fails to teach or suggest all elements of the present claims. Reconsideration and withdrawal of these rejections are respectfully requested.

Claim Rejection Over U.S. Patent No. 5,445,327 to Creehan

Claim 13 stands further rejected under 35 U.S.C. § 102(b), as allegedly anticipated by, or in the alternative, under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent No. 5,445,327 to Creehan (“Creehan”). (Office Action dated May 18, 2006, page 5) Applicant respectfully traverse this rejection.

The Examiner has stated that Creehan teaches a composite comprising a polymer; a filler comprising carbon fibrils and carbon black; and a viscosity modifier, which is made by mixing the components in a stirred ball mill with shear and impact forces and substantially uniformly dispersing the filler throughout the matrix material, and this will inherently meet the ratio of resistivities. (Office Action dated May 18, 2006, page 5)

Creehan discloses “adding dry ice to the mill to cool the contents to a temperature at or near which the resin is transformed into a brittle solid.” (Col. 4, ll. 5-7) In other words, Creehan teaches cooling the thermoplastic resin below its glass transition temperature. In direct contradistinction, the present claims require heating the polymeric resin to a temperature greater than its glass transition temperature or to a temperature greater than its melting temperature. Applicant respectfully submits that Creehan therefore fails to teach or suggest all the elements and cannot anticipate the present claims.

The Examiner has further stated that it would have been obvious to optimize the degree of dispersion by varying the milling time. (Office Action dated May 18, 2006, page 5) The present application is not directed to optimizing the degree of dispersion; instead it is directed to modifying the viscosity such that the ratio of resistivity in the direction parallel to a flow direction to that in the direction perpendicular to the flow direction to be greater than or equal to

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about 0.15. Applicant respectfully submits that the obviousness rejection is simply without merit. The dry ice-cooled brittle solid of Creehan will not have a flow direction nor a viscosity and therefore cannot render obvious the present claims. Further, shattering the brittle solid in a ball mill will not preserve the aspect ratios of the nanotubes and cannot result in electrical anisotropy. Accordingly, the composition of Creehan will not provide the claimed resistivity ratio. Because Creehan fails to teach or suggest all elements, Creehan necessarily fails to render obvious the present claims. Reconsideration and withdrawal of this rejection are respectfully requested.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and withdrawal of the rejections and allowance of the case are respectfully requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 50-1131.

Respectfully submitted,

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